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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

ILDEBRANDO, CHRISTINA A

ART UNIT PAPER NUMBER

1725

DATE MAILED: 03/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application N .

09/869,623

Applicant(s)

YANG ET AL.

Examiner

Christina Ildebrando

Art Unit

1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 3-4, 5-6, and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claims 3-4 recite the limitation "Y." There is insufficient antecedent basis for this limitation in the claims. It is not clear if "Y" and "y" are intended to refer to the same value. If Y refers to the number of cation sites for metal M and the total number of cation sites is 96, it appears (from claim 1) that the maximum value for Y should be 9.6, i.e. M occupies about 10% of the total cation sites.

4. Claims 5-6 recite that the silver is present in an atomic amount greater than 0 up to about 20 atomic units. This recitation is confusing because it is not clear that this range would fall within the maximum range recited in claim 1, up to about 10% of the cation sites are M.

5. Claim 13 recites that the copper is present in an atomic amount greater than 0 up to about 20 atomic units. This recitation is confusing because it is not clear that this range would fall within the maximum range recited in claim 1, up to about 10% of the cation sites are M.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-4, 7-10, 14-17, and 19 are rejected under 35 U.S.C. 102(a) as being anticipated by JP 10-128106.

JP 10-128106 discloses a zeolite X adsorbent which has been ion exchanged with lithium and an additional monovalent cation such as silver. The lithium is exchanged in the range of 80-88% and the silver is exchanged in the range of 2-4% [0027]-[0029]. In example 4, a zeolite X having an Si/Al<sub>2</sub> of 2.5 is exchanged with 87% Li and 3% Ag. In example 9, a zeolite X having a Si/Al<sub>2</sub> of 2.0 is exchanged with 87% Li and 2% Ag. The adsorbent is used in PSA process to selectively adsorb nitrogen from air (Claims and [0063]-[0064]).

The reference teaches that the zeolite X in sodium form is first ion exchanged with lithium followed by ion exchange with a cation such as silver [0047]-[0056]. It is taught that the exchanged zeolite may be heat treated at 300-600 degrees C in vacuum [0057]. Refer also to the examples.

With regards to the properties recites in claims 1 and 7-10, i.e. the formation of metallic silver clusters, it is the position of the examiner that because the reference

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teaches the same heat treatment step of the lithium and silver exchanged zeolite under the same conditions, the same product (i.e. metallic clusters) would inherently form.

When the examiner has reason to believe that the functional language asserted to be critical for establishing novelty in claimed subject matter may in fact be an inherent characteristic of the prior art, the burden of proof is shifted to Applicants to prove that the subject matter shown in the prior art does not possess the characteristics relied upon. *In re Fitzgerald et al.* 205 USPQ 594.

As each and every element of the claimed invention is taught in the prior art as recited above, the claims are anticipated by JP 10-128106.

8. Claims 1, 10-16, and 18-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Coe et al.

Coe et al. (US 5,417,957) discloses a binary exchanged zeolite having an exchangeable ion content of between 5-95% lithium and a second ion such as copper (column 3, lines 30-40). Preferably, the zeolite is ion exchanged with 10-30% of the second ion and 90-70% of lithium and most preferably, the zeolite is ion exchanged with 10% of the second ion and 82% lithium (column 3, lines 40-50). Given the % exchanged detailed by the reference, it appears that the second ion, i.e. copper, would be present in an amount greater than sodium, but less than Li, as required by the instant claims. A preferred use for the product adsorbent is the separation of nitrogen from oxygen in air using a PSA process (column 4, lines 45-70 and column 5, lines 1-10).

The reference teaches that the adsorbent may be prepared by exchanging a sodium X zeolite with lithium to produce a lithium exchanged X zeolite which is them

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partially exchanged with the second ion to achieve the desired adsorbent (column 4, lines 20-35). Coe et al. teaches that prior to use the zeolite is dehydrated by heating the exchanged zeolite in a non-reactive gas at a temperature in the range of 300-600 degrees C (column 5, lines 35-60).

With regards to the properties recites in claims 1 and 10, i.e. the formation of metallic silver clusters, it is the position of the examiner that because the reference teaches the same heat treatment step of the lithium and copper exchanged zeolite under the same conditions, the same product (i.e. metallic clusters) would inherently form. When the examiner has reason to believe that the functional language asserted to be critical for establishing novelty in claimed subject matter may in fact be an inherent characteristic of the prior art, the burden of proof is shifted to Applicants to prove that the subject matter shown in the prior art does not possess the characteristics relied upon. *In re Fitzgerald et al.* 205 USPQ 594.

As each and every element of the claimed invention is taught in the prior art as recited above, the claims are anticipated by Coe et al.

### ***Allowable Subject Matter***

9. Claims 5-6 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach or suggest a lithium and silver exchanged

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zeolite X or zeolite LSX wherein the sodium is present in an atomic amount less than the silver.

**Conclusion**


11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Ildebrando whose telephone number is (703) 305-0469. The examiner can normally be reached on Monday-Friday, 7:30-5, with Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

CAI  
March 15, 2003

  
TOM DUNN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700